

REMARKS

The application has been amended to place the application in condition for allowance at the time of the next Official Action.

The title of the invention is amended and is believed descriptive of the claimed invention. Accordingly, withdrawal of the objection to the title is respectfully requested.

A substitute Abstract of the Disclosure is provided on an accompanying separate sheet that is believed to address the objection to the Abstract noted on page 2 of the Official Action.

The specification is amended to include section headings.

Claims 1-12 were previously pending in the application.

Claims 1-6 and 11 are canceled and new claims 13-19 are added. Therefore, claims 7-10 and 12-19 are presented for consideration.

The new claims are believed to address the claim objections noted on pages 2 and 3 of the Official Action. In addition, claims 8-12 are amended to address the claim objections noted on page 3 of the Official Action.

Claims 1-12 were rejected under 35 USC §102(b) as being anticipated by ACKER 6,427,314. That rejection is respectfully traversed.

Claims 1-6 are replaced with new claims 13-18 such that new claim 13 is the independent claim with claims 14-18 and

original claims 7-10 and 12 depending therefrom. Support for the new claims can be found at least in the original claims and on page 1, lines 18-24, page 5, lines 28-30, page 8, lines 14-17, page 17, line 29 to page 18, line 10, page 25, lines 4-15, page 5, lines 15-19, page 8, lines 1-13, page 17, lines 4-14, page 19, line 6 to page 21, line 22 and Figures 8, 11 and 12.

The new claims are believed to define over ACKER at least because ACKER fails to disclose a device for measuring at least one component of a current, the device including a computing device for determining a derivative of a first magnetic field relative to a second direction and a derivative of a second magnetic field relative to a first direction. The computing device calculates a difference between the derivative of the first magnetic field relative to the second direction and the derivative of the second magnetic field relative to the first direction, the difference being representative of a component of the current as recited in new claim 13.

ACKER does not calculate the difference between a derivative of a first magnetic field relative to a second direction and a derivative of a second magnetic field relative to a first direction.

Rather, ACKER calculates angles between X, Y and Z axes of an apparatus as illustrated in Figure 1, for example, and the X', Y' and Z' axes which are the axes of the sensors. See Figures 2 and 10 of ACKER.

These angles are called pitch, roll and yaw (see column 15, lines 40-43 and lines 50-51). These angles are determined from the normalized value of the magnetic field measured by each sensor according to each axis. For example $H'_{x'}$, x is a normalized magnetic field measured by the sensing element directed along the X' axis when the coils 34 (X axes) are activated (see column 15, line 20).

The device of ACKER is used for determining a position and orientation of a probe 60 within a body of a medical patient (column 1, lines 18-21). The device illustrated in Figure 1 includes three pairs of Helmholtz coils 34, 36 and 38 adapted to generate a magnetic field along each of the X , Y and Z axes.

Coils 34 (X axis), coils 36 (Y axis) and coils 38 (Z axis) are in turn activated to generate a magnetic field. The coils are actuated separately at different modes which are a forward mode, a gradient or a reverse configuration mode (column 12, lines 43-48).

The spatial distribution of the magnetic field along each axis is well known. For example, when the coil 34 is activated in a forward mode, it generates a magnetic field. The spatial distribution of this magnetic field along the X axis is represented in Figure 3 and its spatial distribution along the Y axis is represented in Figure 4 (see column 12, line 53 to column 13, line 7 and column 8, lines 58-62 of ACKER).

The probe 60 is introduced within the patient body. The body of the patient is positioned within the sensing volume 32, i.e. between the Helmholtz coils 34, 36 and 38.

The probe 60 includes means for measuring the magnetic field. According to the first embodiment illustrated in Figure 2 of ACKER, these measuring means are Hall sensors 62, 64, 66. In the second embodiment illustrated in Figures 9 and 10, these measuring means are elongated bars 250 made of magnetoresistive material. These bars are sensitive to a magnetic field having the same direction as the direction of the bars (see column 23, lines 33-38).

Thus, the device of ACKER uses a computer adapted to determine the position of the probe 60 according to the magnetic field measured by the elongated bars. The position of the probe 60 is determined by comparing the magnetic field measured by the bars 250 and a map showing the variation of the magnetic field along the X, Y and Z axes when one coil is activated. Such maps are shown, for example, in Figures 3 and 4 of ACKER.

Accordingly, as set forth above, ACKER calculates the angles between the X, Y and Z axes of the apparatus illustrated in Figure 1 and the X', Y' and Z' axes of the sensors. Thus, ACKER is suitable for determining the position of a probe in a controlled and known magnetic field.

ACKER is unable to measure an unknown magnetic field to determine a current component based on calculating the difference

between a derivative of a first magnetic field relative to a second direction and derivative of a second magnetic field relative to a first direction.

As the reference does not disclose that which is recited, the anticipation rejection is not viable. Reconsideration and withdrawal of the rejection are respectfully requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

YOUNG & THOMPSON

/Liam McDowell/
Liam McDowell, Reg. No. 44,231
745 South 23rd Street
Arlington, VA 22202
Telephone (703) 521-2297
Telefax (703) 685-0573
(703) 979-4709

LM/lrs

APPENDIX:

The Appendix includes the following item:

- a substitute Abstract of the Disclosure